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MAR 23 2006

TRANSMITTAL OF APPEAL BRIEF (Small Entity)

Docket No. 79493US

In Re Application Of: **Estep**

Application No.	Filing Date	Examiner	Customer No.	Group Art Unit	Confirmation No.
09/914,969	September 6, 2001	K. Chang	24628	2675	6639

Invention: **Diving Mask With Embedded Computer System**

COMMISSIONER FOR PATENTS:

Transmitted herewith is the Appeal Brief in this application, with respect to the Notice of Appeal filed on:

☒ Applicant claims small entity status. See 37 CFR 1.27

The fee for filing this Appeal Brief is: **$250.00**

☒ A check in the amount of the fee is enclosed.

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Dated: **March 21, 2006**

Eric D. Cohen
Registration No. 38,110

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CERTIFICATE OF MAILING BY FIRST CLASS MAIL (37 CFR 1.8) Applicant(s): Estep			Docket No. 79493US	
Application No. 09/914,969	Filing Date September 6, 2001	Examiner K. Chang	Customer No. 24628	Group Art Unit 2675

Invention: **Diving Mask With Embedded Computer System**

I hereby certify that this **Applicant's Appeal Brief On Appeal**
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is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)] on **March 21, 2006**.
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(Typed or Printed Name of Person Mailing Correspondence)

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Transmittal of Appeal Brief (Small Entity); Applicant's Brief On Appeal; Check $250.00; and Postcard.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of: Estep	
Serial No.:	09/914,969
Conf. No.	6639
Filed:	September 6, 2001
For:	Diving Mask With Embedded Computer System
Examiner:	K. Chang
Art Unit:	2675

CERTIFICATE OF MAILING

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March 21, 2006
Date

Eric D. Cohen
Reg. No. 38,110

APPLICANTS' BRIEF ON APPEAL PURSUANT TO 37 C.F.R. PART 41 AND M.P.E.P. CHAPTER 1200

Mail Stop Appeal Brief
Commissioner for Patents
P. O. Box 1450
Alexandria, Virginia 22313

Pursuant to the Notice of Appeal filed February 8, 2006, applicant submits below its Appeal Brief in compliance 37 C.F.R. Part 41.

APPEAL BRIEF

I. REAL PARTY IN INTEREST

The real party of interest is the assignee corporation, ComSonics, Inc., 1350 Port Republic Road, Harrisonburg, Virginia 22801.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

III. STATUS OF CLAIMS

Claims 1-18 are currently pending. These claims have been finally rejected and are now on appeal.

IV. STATUS OF AMENDMENTS

No amendments to the pending claims were filed after the date of the final rejection.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The Invention Defined by Independent Claim 1

The present invention of claim 1 relates to a combination underwater personal computer 34 and diving mask 10, as shown in the drawings of Figs. 4 and 7, and reproduced below.

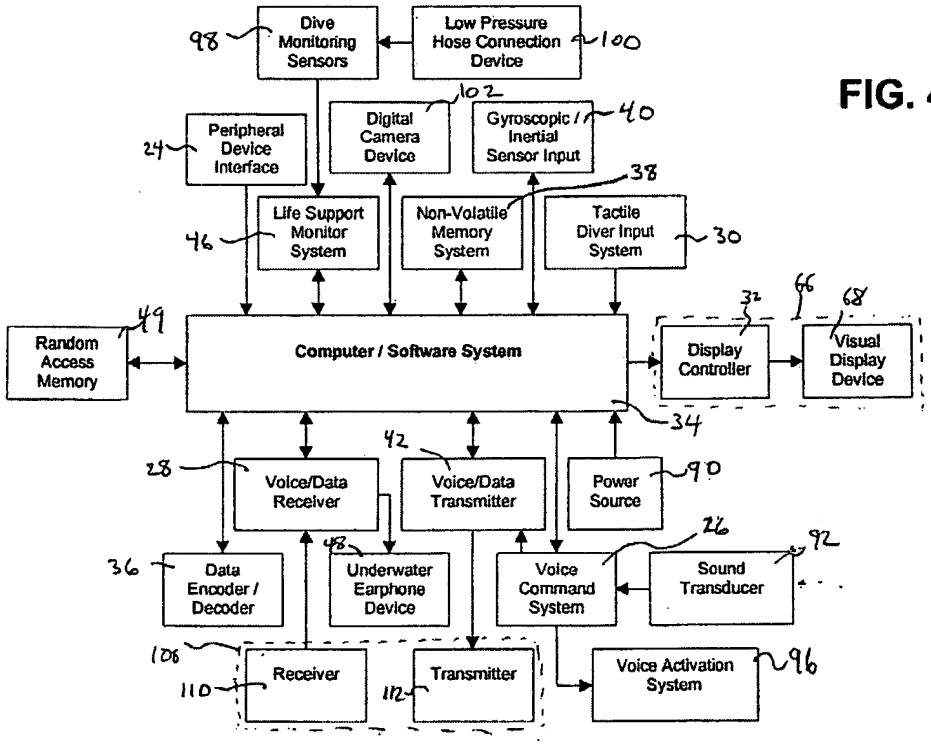

FIG. 4

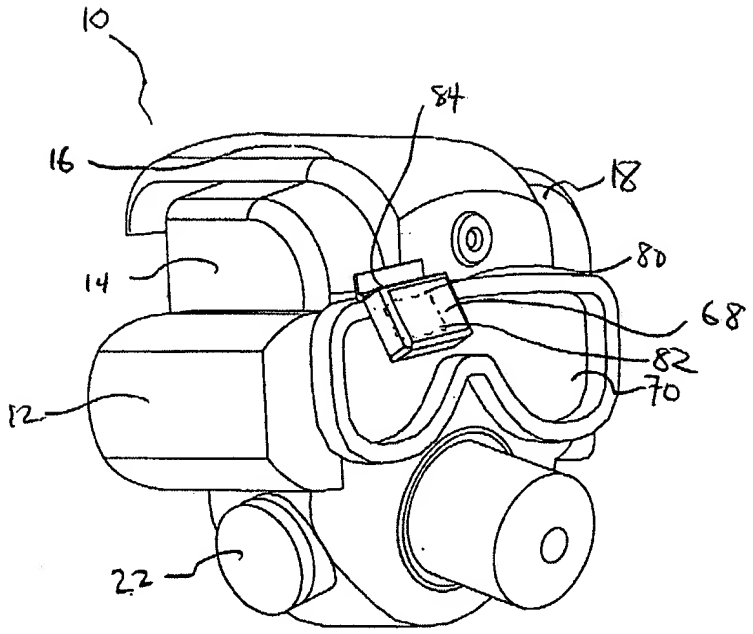

FIG. 7

A voice command or speech recognition system 26 (Page 8, line 21-25) coupled to the computer 34 is responsive to voice commands issued by a diver wearing the system in an underwater diving environment. This permits the diver to control the computer in a generally hands-free manner without the need for typing on a keypad-like device and the like, although some hand-activated switches 30 (Fig. 4) may be provided.

Claim 1 describes the speech recognition system as receiving electrical signals produced by a sound transducer or microphone, and is configured to recognize and identify the electrical signals as spoken words of the diver. This provides input to the computer to direct the functions of the computer system so as to process data and provide visual images to a visual display in response thereto to facilitate hands-free computer operation. Thus, the computer system is not a narrow or dedicated task processor, as are known dedicated dive computers, such as the device in

Hales, but rather, is a general purpose personal computer (page 8, lines 5-12) configured for hands-free operation underwater.

The system includes the visual display device 68 proximate a viewing portion of the diving mask, which viewing portion is defined by the mask lens to permit the diver to view the output of the computer. The visual display device is sealingly isolated from the underwater environment.

Similarly, the entire computer system 34 is disposed in a water-tight portion of the mask, and is operatively coupled to both a sound transducer or microphone 92 (Fig. 4, page 13, line 12) and to the visual display device 68. The microphone is housed in a water-tight speaking chamber configured to sealingly engage a portion of the diver's face, including the diver's mouth. This permits the diver to speak while underwater so as to provide voice commands to the computer. Because the computer system is coupled to the visual display 68 to provide output to the diver, and is coupled to the microphone 92 via the voice command system 26, a fully functional general purpose personal computer is available to the diver.

The Invention Defined by Independent Claim 15

The present invention of claim 15 is similar to the invention recited by claim 1, but rather than reciting the computer system that receives electrical signals produced by the sound transducer and configured to recognize and identify the signals as spoken words, claim 15 characterizes such components as a voice recognition means. If this clause is interpreted under 35 U.S.C. §112 ¶6 as a means-plus-function clause, the function of such a voice recognition means is to identify the diver's spoken words and to provide it as input to the computer system. The corresponding structure of the voice recognition means for performing the above-described

function may be the voice command system 26 (Fig. 7) and associated components (page 3, lines 11-15, page 4, lines 3-6, page 8, lines 21-24, page 15, lines 1-12).

The Invention Defined by Independent Claim 18

The present invention of claim 18 is similar to the invention recited by claim 1, but rather than reciting apparatus limitations, claim 18 is formatted as a method claim.

VI. GROUND OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 1-18 are improperly rejected as being unpatentable under 35 U.S.C. §103(a) over U.S. Patent No. 6,360,182 to Hales in view of U.S. Patent No. 6,066,129 to Larson and U.S. Patent No. 5,574,794 to Valley.

VII. ARGUMENT

A. Summary of the Cited Prior Art

1. U.S. Patent No. 6,360,182 to Hales

Hales discloses a typical underwater dive "computer" capable of monitoring the functions needed for safe diving. The Hales device provides the diver with information, such as, temperature, elapsed dive time, maximum depth, time spent at maximum depth, tank pressure, and the like, and may also provide a log of the various data collected. Hales is an improvement over the typical dive computers, which may hang by attached cable or hose from the diver (Fig. 1), or which may be strapped to the diver's arm (Col. 1, lines 63-64). The improvement proposed by Hales lies in the way that the data is presented to the diver. In that regard, Hales provides an optical display 118 mounted on or in the diving mask to provide the diver with a visual display of the various dive parameters.

It is important to note that all dive computers, such as the Hales dive computer, are programmed at the surface with specific dive parameters, such as the amount of air and/or

mixture and percentages of air and other breathable gases. In this way, the dive computer can correctly calculate and track the body's nitrogen absorption and make calculations to insure safe assent to the surface. It is significant that once underwater, the diver does not and cannot make any changes to the input. This is for safety reasons, and thus the diver cannot induce any errors into the dive computer calculations, which errors could prove life-threatening. The only input accepted from the diver is perhaps to turn on and off the screen backlighting and make adjustment of time presentation to twelve hour or twenty-four hour military time format. Thus, dive computers cannot be considered to be not general purpose computers in any way.

Regarding the Hales dive computer specifically, because the optical display is conveniently mounted, the diver need not reach or grasp for a hanging computer console to bring the data within the diver's field of view, which prior to the Hales device, divers apparently were required to do. This was a drawback with dive computers prior to Hales "because the diver 10 must make a conscious effort to reach for the dive computer console 18 and bring it into his field of view, it is less likely that the diver 10 will check the gauges or indicators 19 as often as is desirable due to environmental distractions or due to the tasks at hand." Col. 2, line 54 - Col. 3, line 6.

Further, the mask mounted optical display of Hales was an improvement because in prior art dive computers, "in murky or turbid water, it may be impossible to observe the gauges or indicators unless they are placed against the viewing window of the diving mask 16. Col. 3, lines 17-20. Thus, the improvement attributable to Hales is directed to placing the display screen of a basic dive computer proximate the diver's mask and elimination of "umbilical cord" needed to tether the dive computer to the diver.

The above-described features meet Hales stated objectives by 1) providing "a dive computer system which conveys important information to a diver in a more safe and efficient manner than previously available devices," (Col. 3, lines 42-43); 2) providing "information to the diver directly in front of the diver's eye," (Col. 3, lines 49-51); and 3) providing "a dive computer which does not present any hazardous high pressure hoses or consoles which can snag on underwater objects and formations or become entangled with the diver's other equipment." (Col. 3, lines 53-58). These are the three main improvements to the self-contained dive computers.

2. U.S. Patent No. 6,066,129 to Larson

Larson discloses a medical laser control system adapted to remotely control the operation of a medical laser using a hand-held control box. The control box is used to permit the laser to fire a sequence of bursts so as to "burn" a pattern on the skin of the patient to effect treatment. Larson also discloses use of speech recognition to permit the surgeon to control laser beam pattern selection, pattern width, beam intensity, or to respond to spoken inquires. Larson refers to prior issued patents for a more in-depth discussion of speech recognition software. Additionally, Fig. 9 of Larson shows a head-up visual display mounted in an open protective face shield of the type having a curved plastic frontal splash guard to protect the surgeon's face and eyes, presumably from blood and/or tissue.

3. U.S. Patent No. 5,574,794 to Valley

Valley discloses a microphone assembly configured to adhesively attach to the external surface of an item that vibrates. Valley is directed to a technique whereby the microphone picks up the vibrations of the surface to which it is attached, which surface vibrates in accordance with spoken human speech. In one embodiment, the microphone is mounted to an external surface of a mask, such as a smoke mask. The mask typically covers the nose and mouth of the wearer. Col.

1, lines 26-29. Because the nose and mouth are covered, the user can speak. The problem addressed by Valley is the ability for the microphone to receive the speech signals. Valley discloses that microphones designed to be placed inside the mask so as to be able to pick up the speech signals give rise to problems caused by wires leading from the inside of the mask to the outside of the mask. Accordingly, Valley solves the problem associated with placement of the microphone inside the mask by attaching the microphone to the outside surface of the mask using a housing that transfers the vibrations induced in the mask caused by the human speaker.

B. The Examiner's Rejection of Claims 1-18 Under § 103(a)

The Examiner rejected the above-identified claims by reciting each element of applicant's independent claim and stating that each of these elements is disclosed in the primary reference to Hales, except for disclosure of two missing elements, namely, the speech recognition system, and the sound transducer being located inside the face mask. The Examiner then submits that the secondary reference to Larson teaches the first missing element of the speech recognition system, and that the remaining secondary reference to Valley teaches the second missing element of the sound transducer located either inside or outside a mask. Using the combination of Hale as the primary reference, and Larson and Valley as the secondary references, the Examiner states that it would have been obvious for one of ordinary skill in the art to combine the computer system in the diving mask of Hales with the speech recognition system in Larson, and that it would have been obvious for one of ordinary skill in the art to combine the computer system in the diving mask of Hales with the sound transducer of Valley, to arrive at applicant's claimed invention. Applicant respectfully traverses this rejection.

<u>The Combination of Hales and Larson</u>

Applicant's claimed invention is directed to a combination underwater diving mask and computer system responsive to voice commands to provide the diver with a complete and operational personal computer system for use underwater. The claimed combination is not merely a dive computer, like the device in Hales, but rather is a fully functioning PC integrated into diving equipment for use underwater. The invention is designed such that the user can speak while underwater permitting complete command and control of the computer though the speech recognition system.

In contrast, the device in Hales is much like a typically "dive computer" which is used to permit a diver to keep track of various important underwater parameters to increase safety while diving. Hales is an improvement over the typical dive computers, which prior dive computers hung by an attached cable or hose from the diver. The improvement proposed by Hales lies in the way that the data is presented to the diver and in the elimination of the "umbilical cord." In that regard, Hales provides an optical display 118 mounted on or in the diving mask to provide the diver with a visual display of the various parameters. Because the optical display is conveniently mounted, the diver need not reach or grasp for the tethered dive computer console to bring the data within the diver's field of view. Thus, the improvement attributable to Hales is directed to placing the display screen of a basic dive computer proximate the diver's mask and elimination of umbilical cord needed to tether the dive computer to the diver.

Dive computers in general, and the device disclosed in Hales specifically, do not function as a general purpose personal computer, to which applicant's claimed invention is directed. The device in Hales is a dedicated electronic device capable of only providing the pre-programmed data specified by the manufacturer. As mentioned above under the discussion of Hales, the Hales dive computer, and all dive computers, are intentionally designed not to accept input from the

diver once submerged, aside from very minor display function. This is done for safety reasons so that the diver cannot cause any errors in the basic calculations directed to keeping the diver alive and safe. The device in Hales happens to contain a computer, as does virtually every electronic device existing today, but it is not a general purpose computer or fully functioning personal computer. Dive computers, such as the improved dive computer in Hales is a fixed-function instrument that essentially outputs sensor data, which device happens to contain some form of computer, but is not a general purpose computer in any sense. A general purpose computer can run a host of applications, such as spreadsheets, word processors and the like, all of which *could* run on applicant's claimed invention, if one wanted to do so underwater.

As the Examiner admits, Hales does not provide a speech recognition system nor does it provide a sound transducer, such as a microphone. Additionally, Hales is missing many other elements of the claimed invention not mentioned by the Examiner. In that regard, Hales does not teach, disclose or suggest a water-tight speaking chamber, as no speech is contemplated, and further does not teach, disclose or suggest the computer system receiving signals from the sound transducer so as to provide input (commands) to the computer to facilitate hands-free computer operation.

The Examiner apparently supports the rejection stating that Larson provides the missing element of a speech recognition system, which also includes "a speaking chamber configured to sealing[ly] engage a portion of the user's mouth to permit the user to speak" and also includes a sound transducer located proximal the speaking chamber. This is simply not the case. Larson is not even applicable analogous art, as will be addressed.

In that regard, Larson discloses a medical laser control system adapted to remotely control the operation of a medical laser using a hand-held control box. Larson is completely

unrelated to applicant's invention, but happens to mention use of speech recognition programs to permit the surgeon to control laser beam by voice command. Applicant would suspect that thousands of patents could be cited to pick and choose the feature of speech recognition from such a reference.

Applicant respectfully submits that the Examiner misapprehends the technical features of Larson. Larson does not teach or disclose a speaking chamber configured to sealingly engage a portion of the user's mouth. Applicant invites the Examiner to specifically identify where in Larson such disclosure exists. In fact, Larson really does not disclose a face mask at all. Rather, the only teaching remotely close to a mask is shown in Fig. 9 of Larson, which shows an open face shield of the type having a curved plastic frontal splash guard to protect the surgeon's face and eyes, presumably from either blood or tissue splatter. The shield is open and not sealed in any way, having somewhat of a curved front surface extending back just enough to cover the eyes peripherally. It is held in place by a head strap. Fig. 9 also shows some form of visual display referred to as head-up display described at Col. 14, lines 23-39.

However, that is the extent of the Larson disclosure. No speaking chamber is taught or suggested, and certainly no water-tight speaking chamber is contemplated. Not surprisingly, there is no mention of any underwater environment at all, as the field of underwater surgery has not really received its due acceptance among medical practitioners to date.

Further, Larson is not even analogous art, as mentioned above. One significant factor in determining whether a combination of references is proper is whether the references relate to the same problems that are solved by the invention. When problems solved by the inventor are the same problems addressed by the prior art, the art is said to be analogous art. *In re Gorman,* 933 F.2d 982, 986 (Fed. Cir. 1991). Not only is applicant's general purpose underwater personal

diving computer from a completely different field of art as that of Larson, the two fields of art have no relation to each other. Medical laser systems with handheld remote control boxes for such lasers have nothing whatsoever in common with an underwater computer and diving masks. The purpose of each invention is very different. Clearly, the Larson laser system would not have logically commended itself to the applicant's attention in considering how to arrange a general purpose computer for use in an underwater environment.

Not only is applicant's invention from a completely different field of art as that of Larson, and has nothing in common with the present invention, but the only tenuous connection is that Larson tangentially mentions some form of speech recognition. It is highly unlikely that the applicant, when solving his problems regarding how to run a general purpose computer in an underwater environment, even having the Hales disclosure before him, would have looked to or would have been motivated to consider the Larson reference.

Applicant's claimed invention solves the problems of a diver's ability to communicate with and control a fully-functioning computer while simultaneously receiving the screen output of the computer, all while operating in a hostile underwater environment. There is simply no motivation or reason to look to the Larson patent for any guidance or for help in solving any problem encountered by the applicant. Would the inventor look to the open curved face shield of Larson to figure out how to encapsulate and protect the computer in the harsh underwater environment or how to address communication between the diver and the computer? The answer is no. Would the inventor look to Larson to see how to deal with a microphone when using speech recognition technology? Again the answer is no because in applicant's environment, the microphone must somehow be sealed in chamber, yet be capable of receiving the diver's speech.

Larson merely mentions that a microphone converts speech into voltage levels. Col. 14, lines 48-51. Accordingly, applicant submits that Larson is not analogous art.

There is no teaching, suggestion or motivation to make the combination set forth by the examiner. There is nothing in either Hales or Larson that would suggest using the speech recognition system tangentially mentioned in Larson with the dive computer of Hales. It is impermissible to combine the teaching of prior art to produce the claimed invention absent some teaching or suggestion supporting the combination. *In re Fritch*, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992). The Patent Office has the burden to establish a prima facie case of obviousness of the claimed subject matter as a whole within the meaning of § 103. *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988), citing, *In re Piasecki*, 745 F.2d 1468, 1471-72, 223 U.S.P.Q. 785, 787-88 (Fed. Cir. 1984). Further, the burden is only satisfied by illustrating a teaching in the prior art or generally available knowledge that would lead one skilled in the art to combine references. *In re Lalu*, 747 F.2d 703, 705, 223 U.S.P.Q. 1257, 1258 (Fed. Cir. 1984). Generally, a reference that appears to teach away from the claimed invention cannot serve to establish a prima facie case of obviousness. *In re Gurley*, 27 F.3d 551, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994). Even though the nature of the teaching is relevant and must be viewed in substance, the fact that it teaches away is a significant factor to be taken into consideration in determining the non-obviousness of the claimed invention. Id. In the present case, the references cited fail to provide the suggestion or motivation for making the suggested combination, and further, Larson teaches away from the claimed invention for the following reasons:

First, there would be no reason or motivation to consider use of speech recognition, as mentioned by Larson. The self-contained limited dive computer of Hales provides the diver with all of the functions the diver could possibly want in a dive computer, and all communication

between the diver and the computer is adequately handled for the purpose intended. There is no teaching or even a remote suggestion that the diver in Hales would want to utilize the broader functions of a general purpose computer.

Second, Larson merely mentions that a microphone is used with the speech recognition system. Again, any one of perhaps thousands of references can be found that mention speech recognition, like Larson. There would be no reason for an inventor involved in the Hales reference to consult the Larson reference to provide a solution for talking underwater. Does Larson provide some insight regarding microphone technology in an underwater environment? Does Larson provide some way of sealing the microphone in any type of environment. Again, the answer is no.

The fact is that none of the cited secondary references has any relationship to an underwater general purpose computer and don't address the problems encountered in configuring a general purpose computer for underwater use. If Hales and Larson are the closest art found by the Examiner, they clearly miss their mark. Where would the suggestion or motivation come from to combine the speech recognition device of Larson with the dive computer of Hales? Would the surgeon in Larson be contemplating the possibility of performing medical procedures underwater and thus need a solution to address the problem of communication with the computer. Clearly he or she would not, as there is absolutely no possibility that a surgeon would contemplate this scenario. Conversely, the inventor in Hales has no motivation to look to Larson, and receives no suggestion from the disclosure in Larson to employ voice recognition technology in a limited single-function computer, such as the Hales device, because Larson is directed to the non-analogous field of medical laser surgery where the doctor wears an open transparent splash shield in front of his or her face.

The Examiner is using impermissible hindsight by using applicant's invention as a roadmap to recreate applicant's invention by picking and choosing prior art components. To properly combine references, there must be some teaching, suggestion or inference in the cited references that would lead one to combine the relevant teachings. *Ashland Oil, Inc. v. Delta Resins & Refracs., Inc.*, 776 F.2d 281 (Fed. Cir. 1985). In the present case, applicant asserts that there is no teaching, suggestion or motivation in any of the cited references, taken individually or in combination to make the combination suggested by the Examiner to arrive at applicant's claimed invention.

The Combination of Hales and Valley

The Examiner further supports the rejection stating that Valley provides the missing element of a transducer attached inside or outside of a mask, and that it would be obvious to house the sound transducer of Valley in the face mask of Hales. In that regard, Valley discloses a microphone that "adhesively" attaches to the exterior of a mask adapted only for use in a land-based or atmospheric environment. The microphone of Valley attaches to the outside of the mask, not to the inside of the mask.

Applicant respectfully submits that the Examiner is incorrect on two counts. First, the Examiner's statement that "Valley further teach to house the sound transducer inside or outside of the face mask..." is incorrect. And second, the Examiner's statement that "wherein the face mask having a water-tight speaking chamber..." is incorrect. Regarding the first statement, Valley teaches away from using the microphone on the inside of the mask because that "gives rise to problems in leading wires from the microphone to the outside of the mask without leakage of the surrounding atmosphere into the mask." Col. 1, lines 39-41. Valley solves the problem by

attaching the microphone to the outside of the mask. Thus, Valley does not teach placement of a microphone inside a mask, but rather, teaches away from this.

A reference teaches away when one of ordinary skill, upon reviewing the reference, would be discouraged from following the path set out in the reference or suggests that the line of development flowing from the disclosure is unlikely to be productive. *Tec Air, Inc. v. Denso Mfg. Michigan, Inc.*, 192 F3d at 1353 (Fed. Cir. 1999). In the present case, the Valley reference discourages use of a microphone inside the mask due to the wiring problems, and thus teaches away from applicant's claimed invention.

Regarding the second statement, Valley does not teach a sealed water-tight speaking chamber. Rather, the Valley mask is only suitable for land-based situations where the user needs to be isolated from atmospheric contaminants, such as airborne fumes and the like. Applicant respectfully requests that the Examiner point out where Valley even remotely discloses or suggests a water-tight arrangement of any component, and in particular a water-tight speaking chamber. The only type of mask contemplated in Valley is a land-based mask. The problems associated with underwater masks are very different that with land-based masks, for obvious reasons. Thus, Valley does not teach or suggest any water-tight components or methods whatsoever.

Still, the Examiner submits that it would be obvious to combine the sound transducer of Valley's land-based face mask with the Hales underwater diving mask to provide underwater speech to provide applicant's claimed invention including a water-tight speaking chamber and a microphone proximal the chamber to permit the diver to speak while underwater.

Would the inventor of Hales look to Valley to provide a microphone useful in an underwater environment. Applicant submits that there is no motivation or suggestion in Hales (or

in Valley) to convert the Hales underwater diving mask for speech capability, as the limited dive computer of Hales does not need any voice capability. The Hales dive computer is fully operational and provides the diver with all necessary data, without the need for voice input, thus no motivation exists.

What would such a proposed combination look like if one were to make such a combination suggested by the Examiner? Once could contemplate adhesively securing the Valley microphone and assembly to the outside of the Hales diving mask. However, this would not work for several reasons, as described below:

First, the entire focus of the Valley microphone assembly is that the diaphragm arrangement picks up vibrations from the surface of the mask caused by the uttered speech. It is believed that this would work only at surface atmospheric levels and would not work while underwater to any significant depth because the water pressure would essentially dampen out transmission of vibrations to the mask surface.

Second, because the Valley microphone works on the principle of air transmission, the air trapped in the microphone assembly must remain in the assembly while sealed to the surface of the mask. As the pressure of the water increases as the diver descends, the air in the assembly could not equalize and would quickly cause the seal between the assembly and the surface of the mask to rupture. A separate air-filled component could not be feasibly sealed to a surface of an underwater diving mask.

Third, and very significantly, it is known that voice recognition technology requires a high quality voice signal to function properly. In fact, when voice recognition technology is used with ordinary computers, special microphone and electronic circuitry is needed because the "built-in" microphones in most PC's are not of sufficient quality to permit speech recognition. It

is commonly known that the quality of the speech signal is a primary requirement in successful speech recognition.

It is for this reason that applicant's claimed invention includes a sealed or water-tight speaking chamber within the mask. In that way, the diver's speech is directly transmitted to the microphone within the chamber, with nothing to degrade or impede the signal, and no structures or components to intervene. Speech recognition technology could not function if the speech signal were first "transmitted" to the lens surface of the mask, and then "picked up" by a vibrating diaphragm located in an assembly glued to the outside of the mask. This would be an absurd combination.

Fourth, using the externally attached microphone assembly of Valley with the Hales mask would further block the viewing portion of the mask thus limiting the diver's field of view. It's sufficiently disadvantage that the visual display of Hales mask initially blocks some portion of the mask. The addition of the Valley external microphone to the viewing portion of the mask would block an additional area. Common sense would dictate that the viewing portion of an underwater diving mask should be as unblocked and open as possible.

The combination of the externally mounted Valley microphone with the Hale mask would not be feasible nor would it lead to applicant's claimed invention, even if there were some suggestion or motivation to make the combination, which there is not. The resulting combination would be an inoperative device. It is settled law that there is no motivation to modify a prior art device if the modification would render the device inoperable for its intended purpose. *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339 (Fed. Cir. 2001).

Hales, Larson and Valley

Applicant submits that there is no teaching, suggestion or motivation to combine the speech recognition feature disclosed in Larson's medical laser system with the diving mask of Hales' dive computer to arrive at applicant's claimed invention. The cited secondary reference to Larson is non-analogous art and teaches away from applicant's invention, while Valley further teaches away, with the resulting combination being inoperable. Accordingly, there is no teaching, suggestion or motivation in any of the cited references, either taken alone, or in combination, to make the combination suggested by the Examiner. Such a combination if made would be inoperative. Therefore, applicant submits that the independent claims and claims depending therefrom are not obvious over the cited references.

VIII. CLAIMS APPENDIX

See attached Appendix of claims on appeal.

IX. EVIDENCE APPENDIX

Not applicable.

X. RELATED PROCEEDINGS APPENDIX

Not Applicable.

CONCLUSION

In conclusion, applicant submits that the claims 1-18 as presently pending are not obvious over the primary reference to Hales, in view of Larson and Valley, either separately or in combination. To this end, applicant respectfully requests that the Board reverse the decision of the Examiner finally rejecting 1-18.

The Commissioner is hereby authorized to charge any additional fee which may be required for this application under 37 C.F.R. §§ 1.16-1.18, including but not limited to the issue fee, or credit any overpayment, to Deposit Account No. 23-0920. Should no proper amount be

enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal, or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 23-0920. A duplicate copy of this sheet(s) is enclosed.

Respectfully submitted,

WELSH & KATZ, LTD.

By

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March 21, 2006

IX. APPENDIX - CLAIMS ON APPEAL

1. (previously presented) A combination underwater diving mask and personal computer responsive to voice commands for use by a diver in an underwater diving environment, the diving mask and computer combination comprising:

a viewing portion defined by the diver's face and a lens;

a visual display device proximate the viewing portion to provide visual images to the diver including providing computer output screens;

a water-tight speaking chamber configured to sealingly engage a portion of the diver's face including the diver's mouth to permit the diver to speak while underwater so as to provide voice commands to the personal computer while underwater;

a sound transducer located proximal the speaking chamber;

a computer system disposed in a portion of the mask and operatively coupled to the sound transducer and to the visual display device, the computer system configured to provide the diver with a fully functional personal computer;

the computer system, the viewing portion and the speaking chamber sealingly isolated from the underwater diving environment; and

the computer system receiving electrical signals produced by the sound transducer and configured to recognize and identify the electrical signals as spoken words of the diver, the identified spoken words providing input to the computer; to direct the functions of the computer system so as to process data and provide visual images to the visual display in accordance with the processing of the data in response thereto to facilitate hands-free computer and other operation of the diver.

2. (original) The diving mask of claim 1 wherein the computer system is operatively coupled to the display device such that no wiring or tether external to the diving mask is required.

3. (original) The diving mask of claim 1 wherein the display device is operatively coupled to the computer system by short length of cabling so that no external cabling extends from the diving mask in a region defined by the diver's head portion to a part of the diver located away from the diver's head.

4. (original) The diving mask of claim 1 wherein: the sound transducer is selected from the group consisting of a microphone, crystal microphone, piezoelectric transducer, throat/larynx transducer and vibration transducer;

the computer system is selected from the group consisting of a computer, microprocessor, RISC processor, single-chip computer, single-board computer, controller, micro-controller and discrete logic computer; and

the display device is selected from the group consisting of a liquid crystal display, LED display, electro-fluorescence display, gas plasma display, prism-type optic display, prismatic projection system and cathode ray tube.

5. (original) The diving mask of claim 1 further including non-volatile storage operatively coupled to the computer system, the non-volatile storage is selected from the group consisting of a ROM, PROM, EPROM, flash memory, optical memory, static memory, bubble memory, memory sticks and hard disk memory.

6. (original) The diving mask of claim 1 wherein the computer system further includes a speech recognition portion configured to receive and process the electrical signals from the

sound transducer, and recognize and identify the electrical signals as the spoken words from the diver, and to provide input to the computer system corresponding to the spoken words.

7. (original) The diving mask of claim 1 further including a speech recognition processor operatively coupled to the sound transducer to receive the electrical signals therefrom, and operatively coupled to the computer system, the speech recognition processor configured to recognize and identify the electrical signals as the spoken words from the diver and to provide input to the computer system corresponding to the spoken words.

8. (original) The diving mask of claim 1 wherein the computer system provides a plurality of predetermined functions displayed on the display device, the computer system performing at least one of the predetermined functions in response to the input representative of the spoken words of the diver.

9. (original) The diving mask of claim 1 wherein the computer system provides one or more menus to the display device, each menu containing one or more predetermined functions executable by the computer system.

10. (original) The diving mask of claim 9 wherein the plurality of menus include a hierarchical set of menus.

11. (original) The diving mask of claim 8 wherein the predetermined functions are selected from the group consisting of a menu, pull-down menus, digital camera control applications, life support applications, general purpose applications, gyroscopic/inertial sensor applications, transmitter and receiver applications and power management applications.

12. (original) The diving mask of claim 11 further including a gyroscopic/inertial sensor operatively coupled to the computer system.

13. (original) The diving mask of claim 1 further including

a receiver system operatively coupled to the computer system and configured to receive incoming data from the underwater diving environment;

a transmitter system operatively coupled to the computer system and configured to transmit data to the underwater diving environment; and

the receiver system and transmitter system located proximal the diving mask and sealing isolated from the underwater diving environment.

14. (original) The diving mask of claim 13 wherein the data is selected from the group consisting of speech data, digital data, numerical data and graphical data.

15. (previously presented) A combination underwater diving mask and personal computer responsive to voice commands for use by a diver in an underwater diving environment, the diving mask and computer combination comprising:

a viewing portion defined by the diver's face and a lens;

a display means for providing visual images to the diver including providing computer output screens;

a water-tight speaking chamber configured to sealingly engage a portion of the diver's face including the diver's mouth to permit the diver to speak while underwater so as to provide voice commands to the personal computer while underwater;

a sound transducer located proximal the speaking chamber;

a computer system disposed in a portion of the mask and operatively coupled to the sound transducer and to the display means the computer system configured to provide the diver with a fully functional computer;

the computer system, the viewing portion and the speaking chamber sealingly isolated from the underwater diving environment;

voice recognition means for recognizing and identifying spoken words of the diver; and

the identified spoken words provided to the computer system as input thereto to direct the functions of the computer system so as process data and to provide visual images to the display means in response thereto to facilitate hands-free computer and other operation of the diver.

16. (original) The diving mask of claim 15 wherein the voice recognition means is operatively associated with the computer system and is configured to receive the electrical signals from the sound transducer, the voice recognition means configured to recognize and identify the electrical signals as the spoken words from the diver and to provide input to the computer system corresponding to the spoken words.

17. (previously presented) The diving mask of claim 15 wherein the voice recognition means further includes a voice recognition processor operatively coupled to the computer system and coupled to the sound transducer to receive the electrical signals therefrom, the speech recognition processor configured to recognize and identify the electrical signals as the spoken words from the diver and to provide input to the computer system corresponding to the spoken words.

18. (previously presented) A method of controlling a personal-type computer responsive to voice commands in an underwater diving environment to facilitate hands-free operation of the diver, the method comprising the steps of:

providing the diver with a diving mask having a viewing portion defined by the diver's face and a lens;

placing a visual display device proximate the viewing portion to provide visual images, including computer output screens, to the diver;

incorporating a sound transducer within a water-tight speaking chamber, the speaking chamber configured to sealingly engage a portion of the diver's face including the diver's mouth to permit the diver to speak while underwater;

operatively coupling a personal-type computer system with the sound transducer and the visual display device;

sealingly isolating the computer system, the viewing portion, and the speaking chamber from the underwater diving environment;

speaking while underwater into a sound transducer located proximal the speaking chamber to produce electrical voice command instructions for the computer;

receiving and processing the electrical voice command instructions by the computer system, the computer system recognizing and identifying the electrical signals as spoken words of the diver, the identified spoken words providing input to the computer; and

directing the computer system to provide visual images to the visual display in response to the identified spoken words and the processing of data to facilitate hands-free operation of the diver.